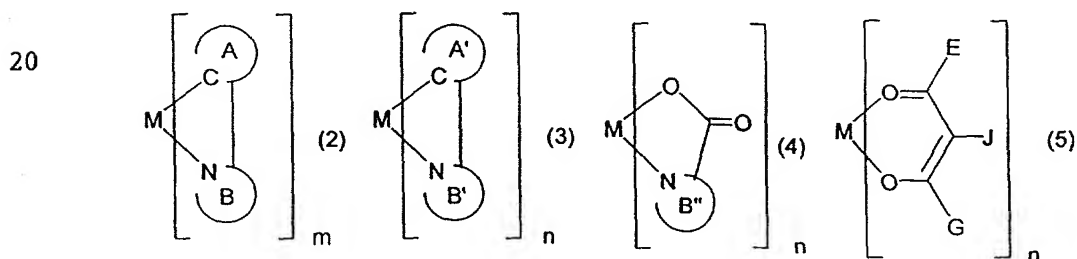


CLAIMS

1. An organic luminescence device, comprising: a pair of electrodes each disposed on a substrate, and at least one luminescence layer comprising an organic compound disposed between the electrodes; wherein the luminescence layer comprises a non-luminescent first organic compound and a phosphorescent second organic compound represented by formula (1) shown below, and the second organic compound is present at a concentration of at least 8 wt. % in the luminescence layer:

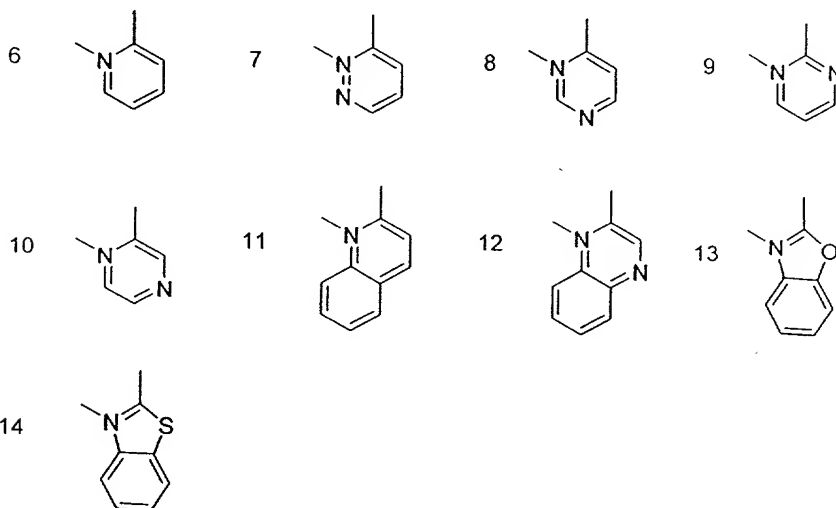


wherein M is a metal atom of Ir, Pt, Rh or Pd; L and L' are mutually different bidentate ligands; m is 1, 2 or 3; n is 0, 1 or 2 with the proviso that m+n is 2 or 3; a partial structure ML_m is represented by formula (2) shown below and a partial structure ML'_n is represented by formula (3), (4) or (5) shown below:



wherein N and C are nitrogen and carbon atoms, respectively; A and A' are respectively a cyclic group capable of having a substituent and bonded to the

metal atom M via the carbon atom; B, B' and B" are respectively a cyclic group represented by a formula of (6) - (14) shown below capable of having a substituent and connected to the metal atom M via the nitrogen atom:



{wherein the substituent is selected from a halogen atom, a cyano group, a nitro group, a trialkylsilyl group (of which the alkyl groups are independently a linear or branched alkyl group having 1 to 8 carbon atoms), a linear or branched alkyl group having 1 to 20 carbon atoms (of which the alkyl group can include one or non-neighboring two or more methylene groups that can be replaced with -O-, -S-, -CO-, -CO-O-, -O-CO-, -CH=CH- or -C≡C- and the alkyl group can include a hydrogen atom that can be replaced

with a fluorine atom), or an aromatic cyclic group capable of having a substituent (of which the substituent is selected from a halogen atom, a cyano group, a nitro group, a linear or branched alkyl group having 1 to 20 carbon atoms (of which the alkyl group can include one or non-neighboring two or more methylene groups that can be replaced with -O-, -S-, -CO-, -CO-O-, -O-CO-, -CH=CH- or -C≡C- and the alkyl group can include a hydrogen atom that can be replaced with a fluorine atom));

A and B, and A' and B' are respectively bonded to each other via a covalent bond;

E and G are independently a linear or branched alkyl group having 1 to 20 carbon atoms (of which the alkyl group can include a hydrogen atom that can be optionally replaced with a fluorine atom), or an aromatic cyclic group capable of having a substituent (of which the substituent is selected from a halogen atom, a cyano group, a nitro group, a trialkylsilyl group (of which the alkyl groups are independently a linear or branched alkyl group having 1 to 8 carbon atoms), a linear or branched alkyl group having 1 to 20 carbon atoms (of which the alkyl group can include one or non-neighboring two or more methylene groups that can be replaced with -O-, -S-, -CO-, -CO-O-, -O-CO-, -CH=CH- or -C≡C- and the alkyl group can include a hydrogen atom that can be replaced

with a fluorine atom)),

J is a hydrogen atom, a halogen atom, a linear or branched alkyl group having 1 to 20 carbon atoms (of which the alkyl group can include a hydrogen atom that can be optionally replaced with a fluorine atom), or an aromatic cyclic group capable of having a substituent {of which the substituent is selected from a halogen atom, a cyano group, a nitro group, a trialkylsilyl group (of which the alkyl groups are independently a linear or branched alkyl group having 1 to 8 carbon atoms), or a linear or branched alkyl group having 1 to 20 carbon atoms (of which the alkyl group can include one or non-neighboring two or more methylene groups that can be replaced with -O-, -S-, -CO-, -CO-O-, -O-CO-, -CH=CH- or -C≡C- and the alkyl group can include a hydrogen atom that can be replaced with a fluorine atom))};

wherein the compound represented by the formula (1) includes at least one cyclic group having a substituent.

2. An organic luminescence device according to Claim 1, comprising: a pair of electrodes each disposed on a substrate, and at least one luminescence layer comprising an organic compound disposed between the electrodes; wherein the luminescence layer comprises a non-luminescent first organic compound and

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a phosphorescent second organic compound represented
by the above-mentioned formula (1), and the second
organic compound is present at a concentration in the
luminescence layer that is higher than a concentration
5 at which an cyclic group represented by the formula
(1) but containing no substituent in any of the cyclic
groups A and A' or the cyclic groups B and B' exhibits
a maximum luminescence characteristic.

10 3. An organic luminescence device according to
Claim 1, comprising: a pair of electrodes each
disposed on a substrate, and at least one luminescence
layer comprising an organic compound disposed between
the electrodes; wherein the luminescence layer
15 comprises a non-luminescent first organic compound and
a phosphorescent second organic compound represented
by the above-mentioned formula (1), and the second
organic compound is present at a prescribed
concentration of at least 8 wt. % in the luminescence
20 layer providing a maximum luminescence characteristic.

25 4. An organic luminescence device according to
Claim 1, wherein the partial structure ML'_n in the
formula (1) is represented by the formula (3).

5. An organic luminescence device according to
Claim 1, wherein the partial structure ML'_n in the

formula (1) is represented by the formula (4).

6. An organic luminescence device according to
Claim 1, wherein the partial structure ML'_n in the
5 formula (1) is represented by the formula (5).

7. An organic luminescence device according to
Claim 1, wherein n in the formula (1) is 0.

10 8. An organic luminescence device according to
Claim 1, wherein the substituent of the compound of
the formula (1) is fluorine.

15 9. An organic luminescence device according to
Claim 1, wherein the substituent of the compound of
the formula (1) is a trifluoromethyl group.

20 10. An organic luminescence device according to
Claim 1, wherein the substituent of the compound of
the formula (1) is an alkyl group.

25 11. An organic luminescence device according to
Claim 2, wherein said maximum luminescence
characteristic is a maximum luminescence luminance.

12. An organic luminescence device according to
Claim 2, wherein said maximum luminescence

characteristic is a maximum current.

13. An organic luminescence device according to
Claim 2, wherein said maximum luminescence
5 characteristic is an external luminescence efficiency.

14. An organic luminescence device according to
Claim 2, wherein said maximum luminescence
characteristic is a ratio of luminescence flux/power
10 consumption obtained by dividing a luminescence flux
by a power consumption.

15. An organic luminescence device according to
Claim 1, wherein phosphorescence is emitted from the
15 luminescence layer by applying a voltage between the
electrodes.

16. A picture display apparatus, comprising an
organic luminescence device according to Claim 1, and
20 a drive circuit for supplying display data.